

GUIDE SECTION WITH TOOTHED RACK

BACKGROUND OF THE INVENTION

The invention relates to a guide section for axial guidance of a slide for a power tool having an axial toothed rack for longitudinal feed.

This type of guide section with an axial toothed rack is used in particular for drilling rods and guide rails when working rock, for example for core drilling and stone saws. In order to be able to sustain the high flexural torsional moments that occur and at the same time to remain transportable at a length of up to several meters, the guide sections must be configured out of high-rigidity hollow sections of extruded aluminum or aluminum alloy.

According to DE 4326194 a toothed rack is configured in one piece with the guide section. By virtue of the lower strength relative to steel, an equivalently stressable rail had to be formed wider in the case of aluminum sections, whereby consequently wider toothed rack drives were required.

According to US 5549390 a guide section of a guide rail for a drilling tool is configured of a highly rigid hollow section with a toothed rack of rectangular cross-section arranged in a rectangular receiving groove. According to DE 19749625 a guide section configured as a highly rigid hollow section made of extruded aluminum has a wedge-shaped, expanded

receiving groove for a toothed rack. The toothed rack must be fastened by means of separate fastening members in the receiving groove. The fastening bore holes extending through the toothed rack weaken its strength, whereby breakage is more probable.

According to US 5845996, a rack is fastened using several screws and nuts in an undercut fastening groove of a guide section formed of a highly rigid hollow aluminum section. Drilling of the toothed rack and the guide section and subsequent tightening is technologically costly and the number of required components is appreciably increased by the screws and nuts.

SUMMARY OF THE INVENTION

The primary object of the invention is to provide a technologically simple embodiment of a guide section formed of a highly rigid hollow shape with a separate toothed rack.

Essentially, a guide section for guiding a slide of a power tool along a longitudinal axis A with a separate axial toothed rack for the longitudinal advance of the slide has a toothed rack arranged in an external open receiving groove with an outwardly oriented arrangement of teeth, wherein the toothed rack in cross-section forms at least two opposing undercut sides, by means of which the edges of the receiving groove of the guide section are

at least partially inserted.

By virtue of the two opposing sides laterally undercut relative to the teeth, the toothed rack can be permanently form – lockingly seamed in the sides in the plastically deformed material protruding into the open undercut of the guide section for the toothed rack. In particular, a plastic fluid material like aluminum is compressed over the undercut sides by means of two rollers moved along the toothed rack and thus beaded, which is technologically very simple.

Advantageously, the toothed rack has two laterally disposed longitudinal grooves, whereby the groove edges are formed by the inner remnant of the groove surface and the undercuts by means of the longitudinal grooves. In addition, such sides can be technologically simply manufactured of standardized toothed racks available in cut lengths with rectangular cross-section.

Advantageously, the longitudinal grooves are arranged completely outside of the toothing, whereby the toothing in a technologically simple manner lie directly adjacent to each other transverse to the longitudinal extent of several toothed racks for clamping insertion of the toothing.

Advantageously, the toothed rack has at least one axially limited

recess lying opposite to the toothing, in which a connection bushing extending transverse to the longitudinal axis engages with a further guide section, wherein it is used for precise axial positioning of the toothed rack relative to the guide section and in addition can form lockingly absorb longitudinal forces.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be more completely described with reference to an exemplary embodiment, wherein:

Fig. 1 represents a guide section in cross-section;

Fig. 2 represents an enlarged cut-out of zone II of Fig. 1; and

Fig. 3 represents a guide section in longitudinal section along the plane III – III of Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

According to Fig. 1 a guide section 1 made of extruded aluminum with guide surfaces 2 for guiding a slide (not shown) of a power tool (not shown) along a longitudinal axis A of a separate axial toothed rack 3 made of steel, which is arranged in an outwardly open receiving groove 4. The toothed rack 3 has outwardly oriented toothing 5.

According to Fig. 2, the toothed rack 3 in cross-section has two outwardly disposed undercut sides 6a, 6b relative to the tothing 5, over which groove edges 7 of the receiving groove 4 of the guide section 1 is inserted. The toothed rack 3 has two laterally opposing longitudinal undercut grooves 8a, 8b, which are arranged completely spaced from the tothing 5.

According to Fig. 3, the toothed rack 3 in longitudinal section has a groove 9 situated opposite to the tothing 5, in which a connecting bushing 10 extending transverse to the longitudinal axis A engages formlockingly for coupling to an adjoining guide section 1.